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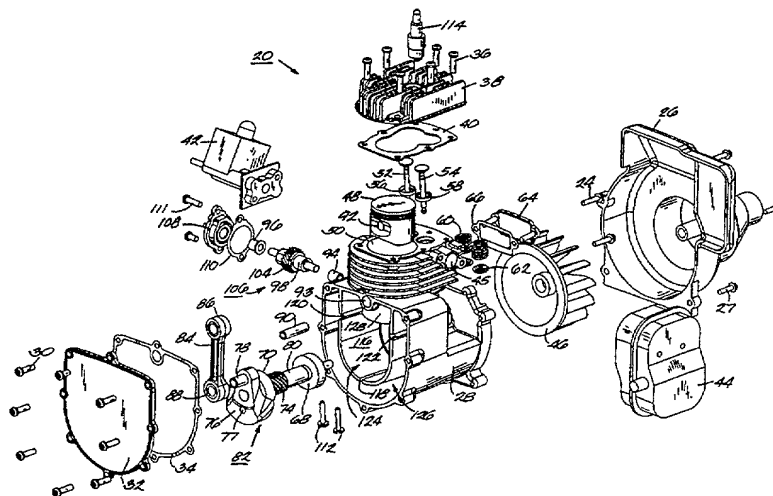
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Published

With international search report.

(54) Title: FOUR-STROKE INTERNAL COMBUSTION ENGINE



(57) Abstract

A four-stroke internal combustion engine (20) is provided. There is provided within an engine housing (28) an oil reservoir (126) and a valve chamber (156) which independently communicate with a crank chamber (124). A strategically placed divider (116) and passageway, located within the engine housing (28), appropriately direct lubricant within the engine housing (28) so that the internal cavity of the engine is lubricated during use in various operating attitudes, and so that the fluid flows to and is held in the proper chambers of the engine housing during storage. There is also provided a breather arrangement for an internal combustion engine (20) which includes a cam shaft (98) having a hollow passageway in communication with the crank chamber (124) and the air intake system of the engine. There is also provided an engine housing which can be utilized for engines having different horse power ratings. There is also provided a crankshaft bearing assembly (68, 70) which prevents damage to the bearing upon insertion of the crankshaft (80) into the crank chamber (124).

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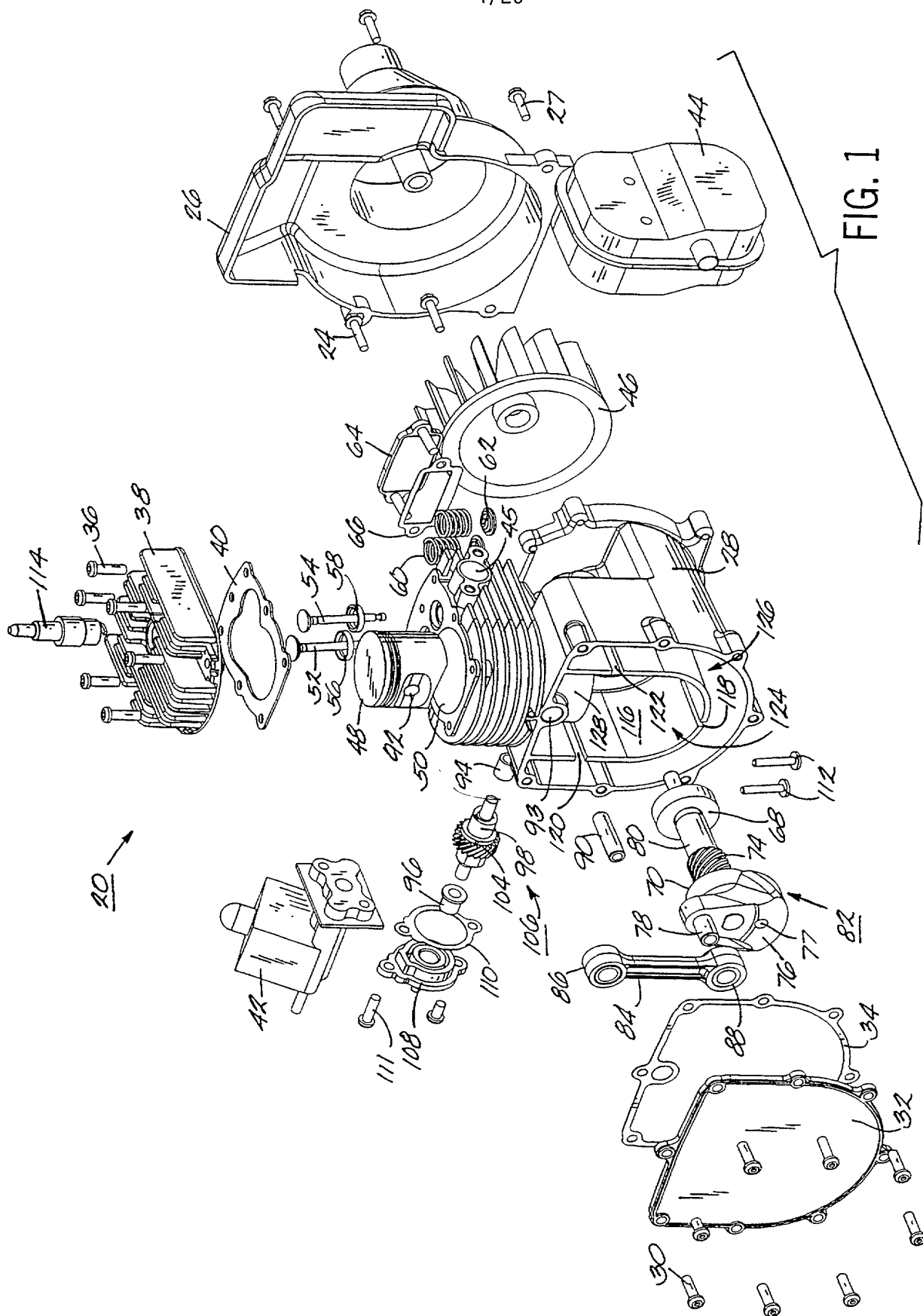
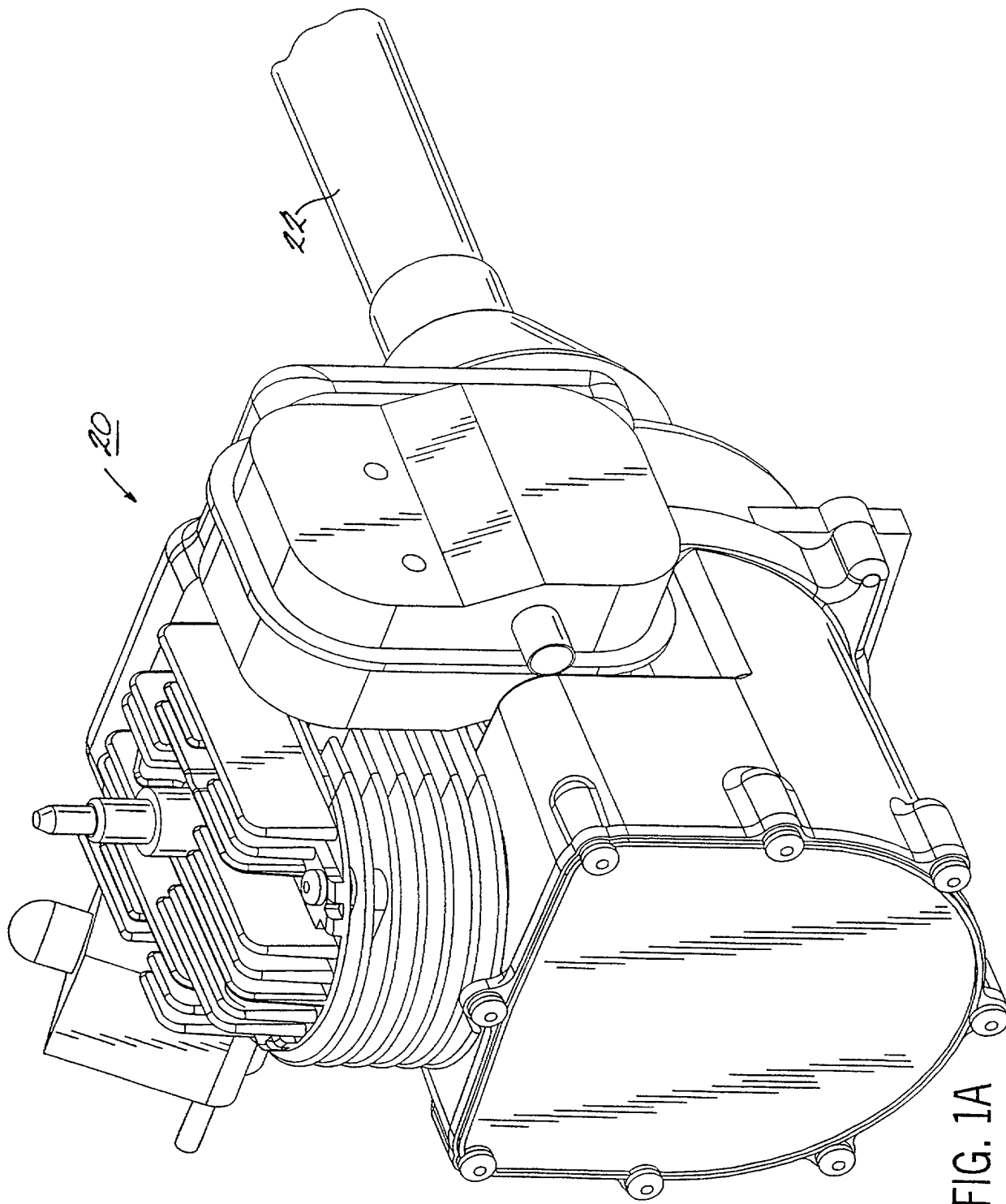


FIG. 1



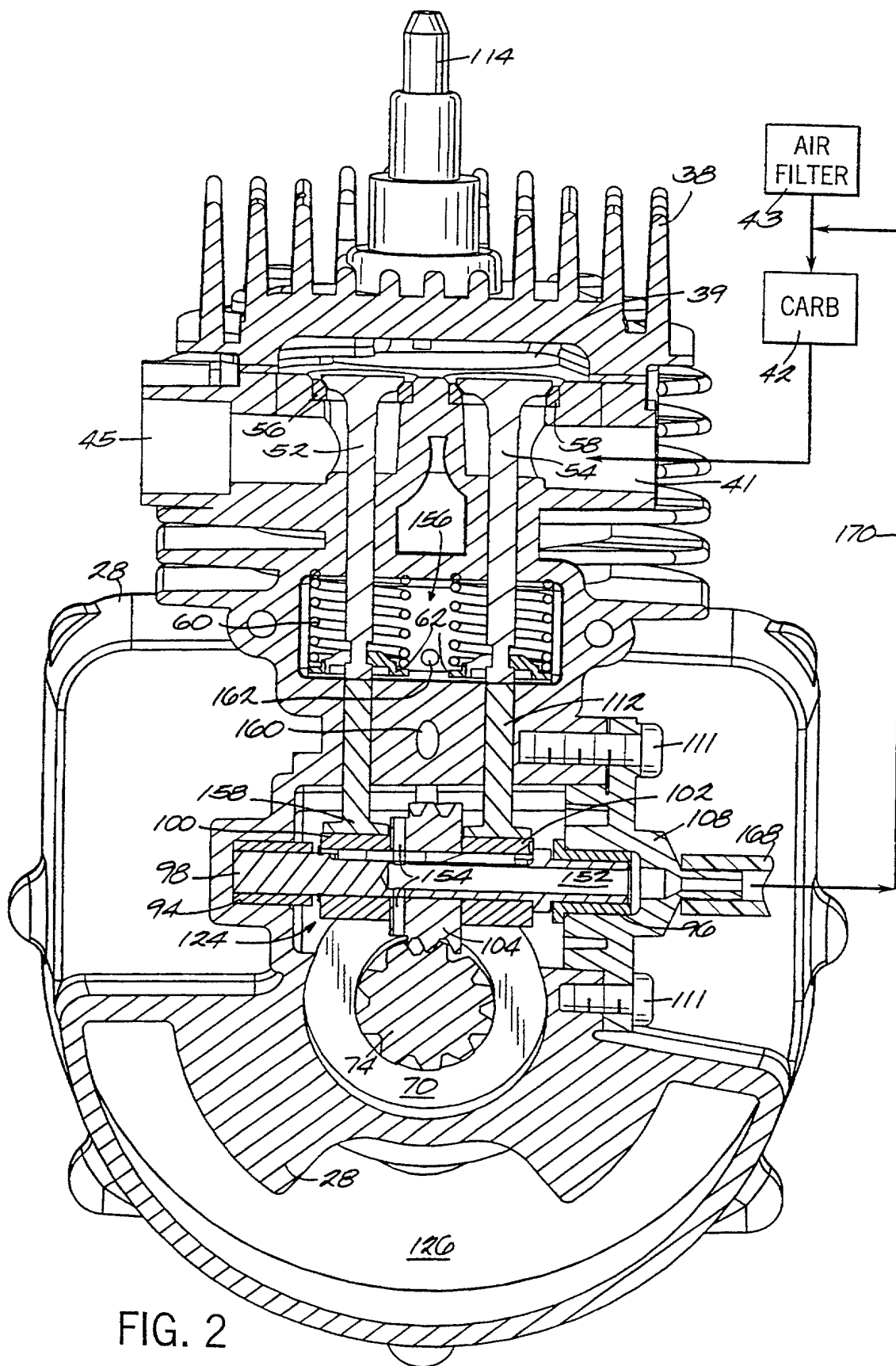


FIG. 2

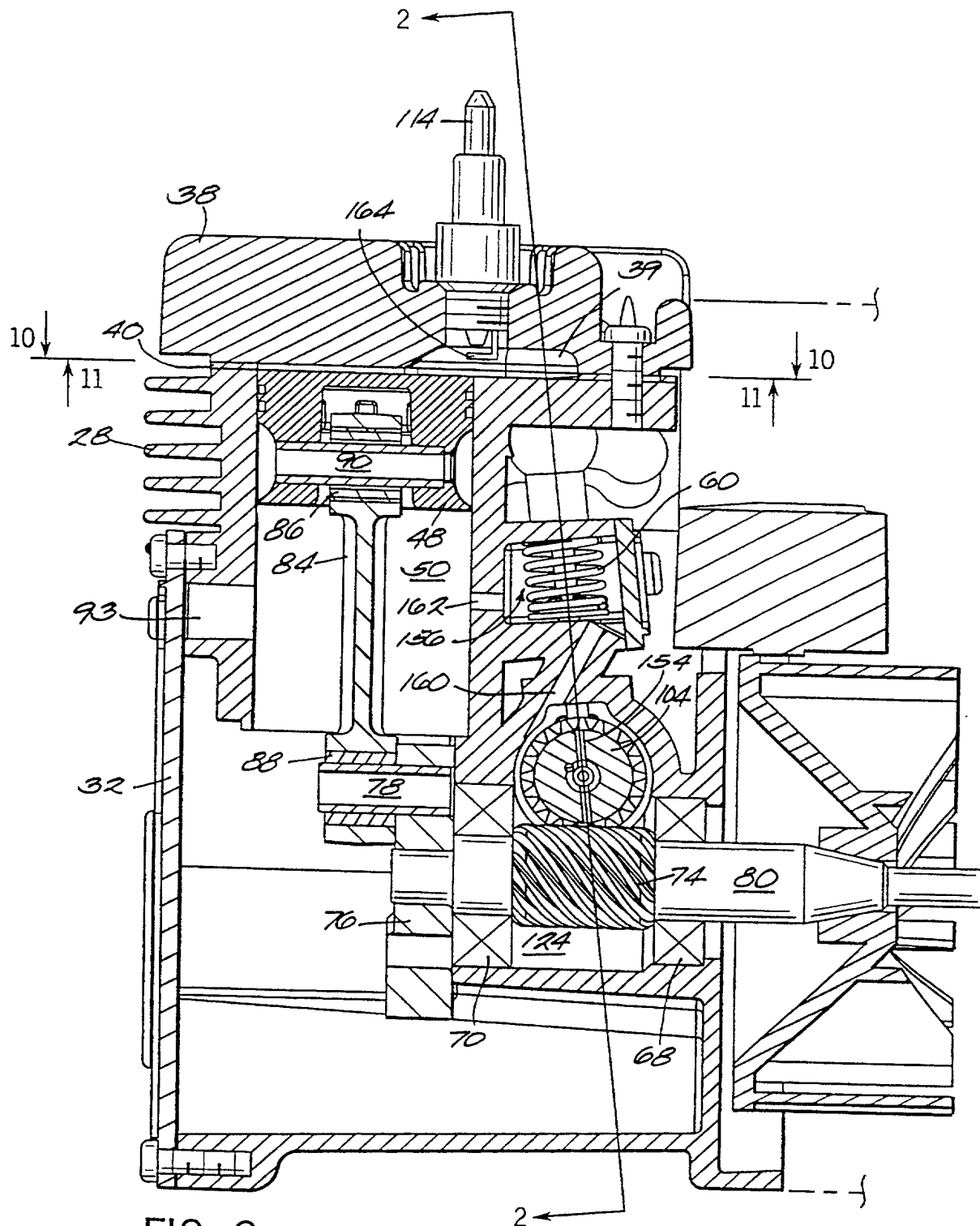
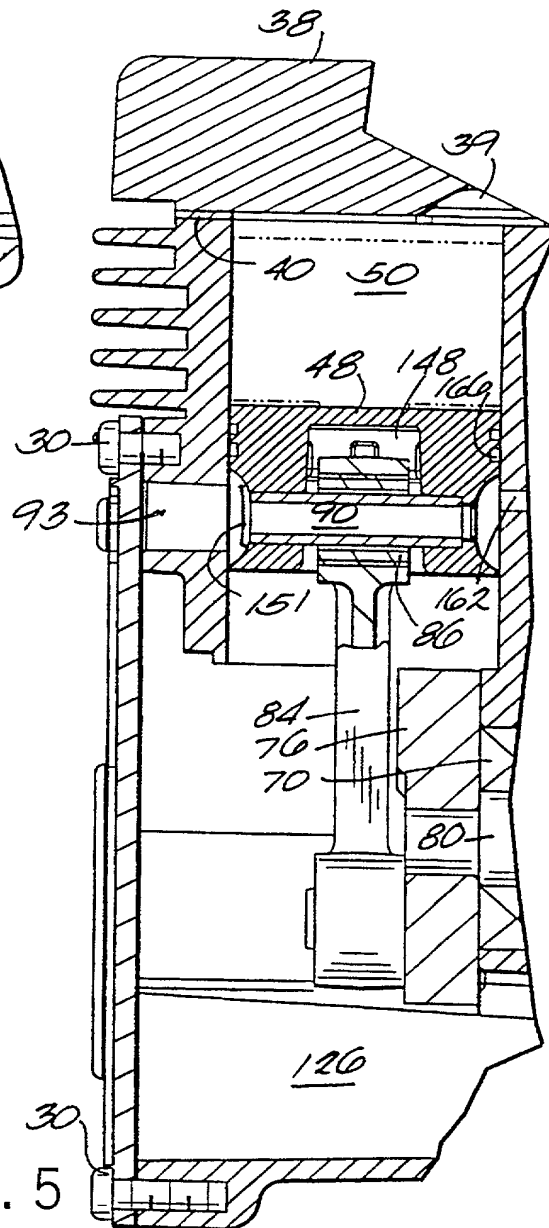
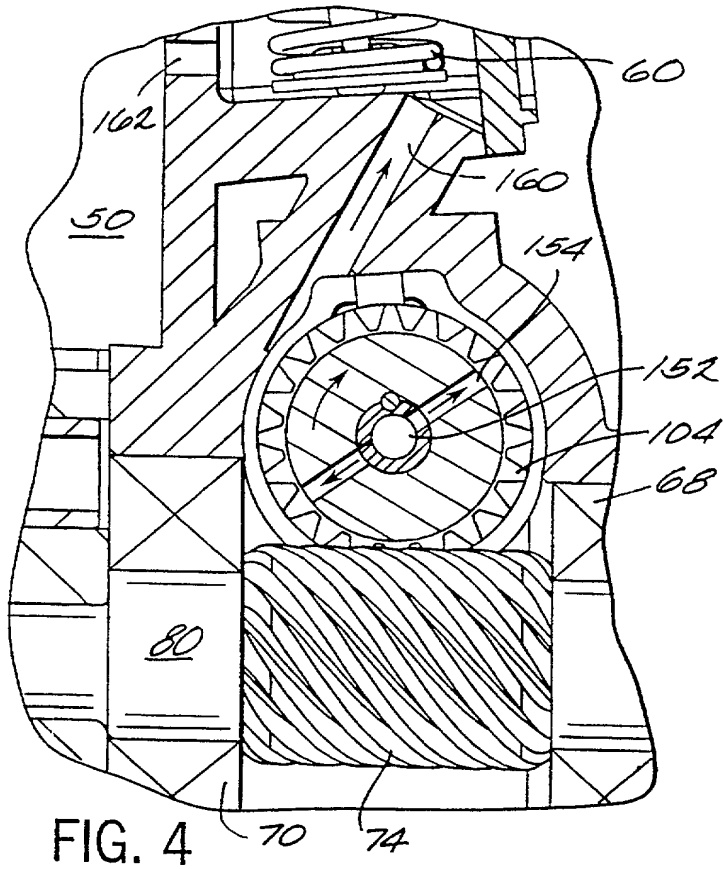


FIG. 3

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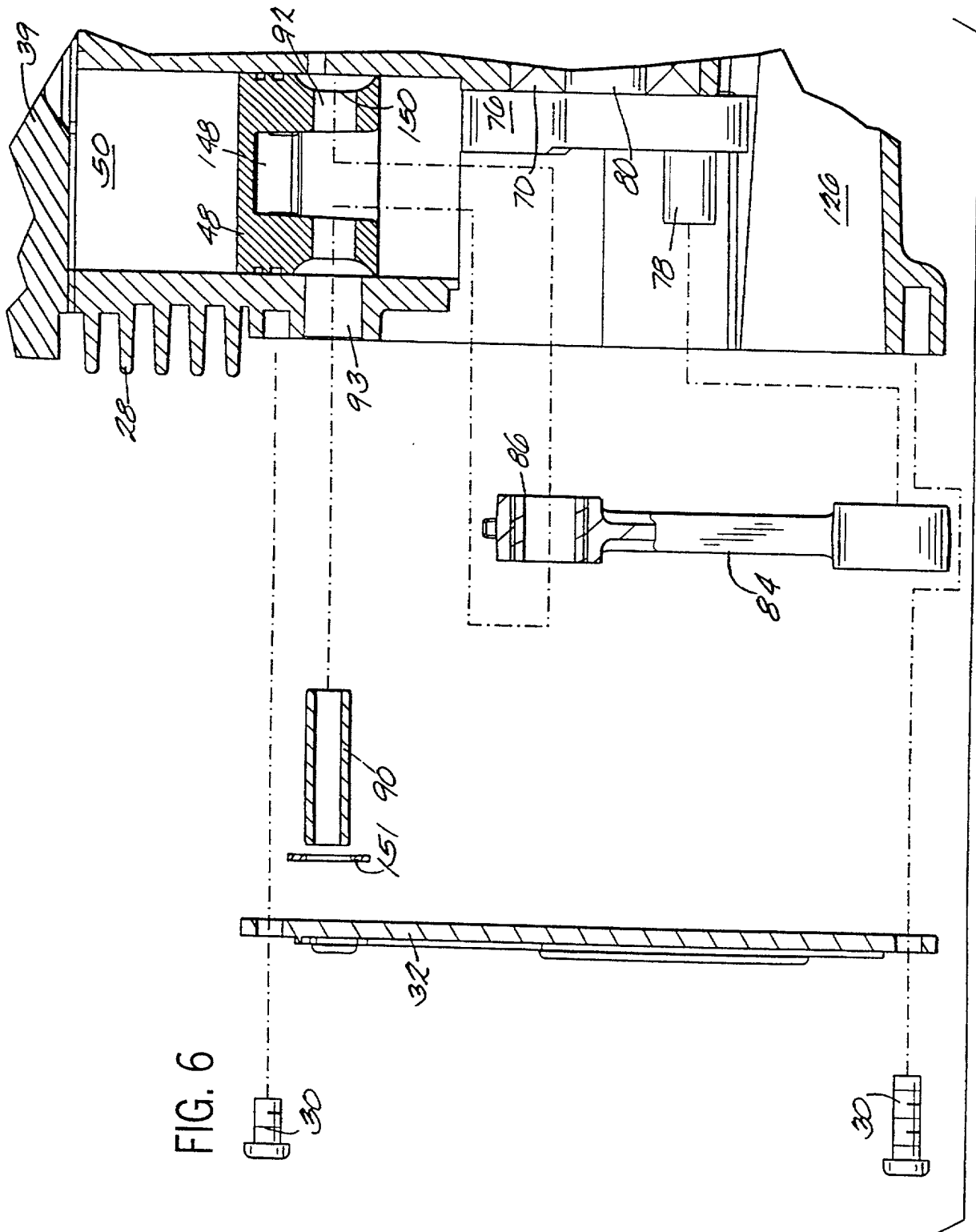
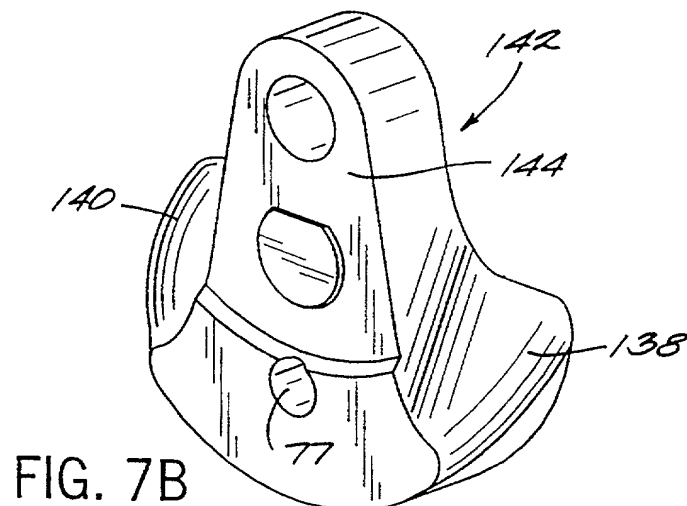
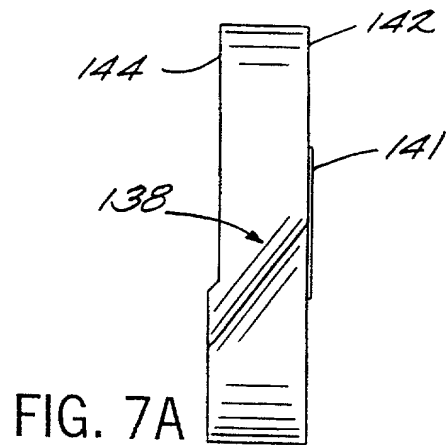
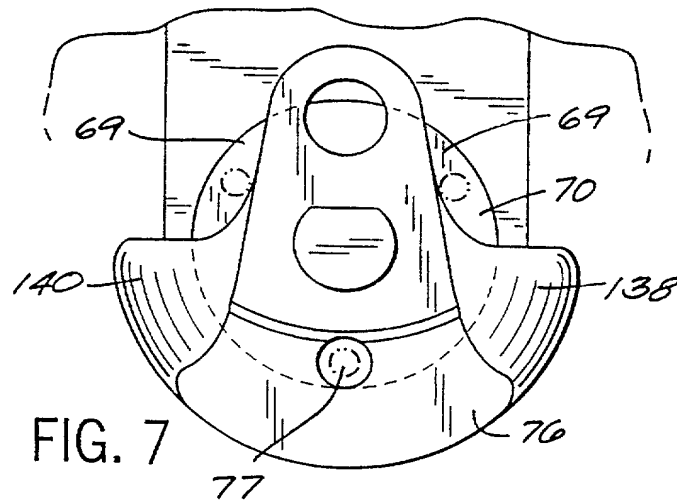
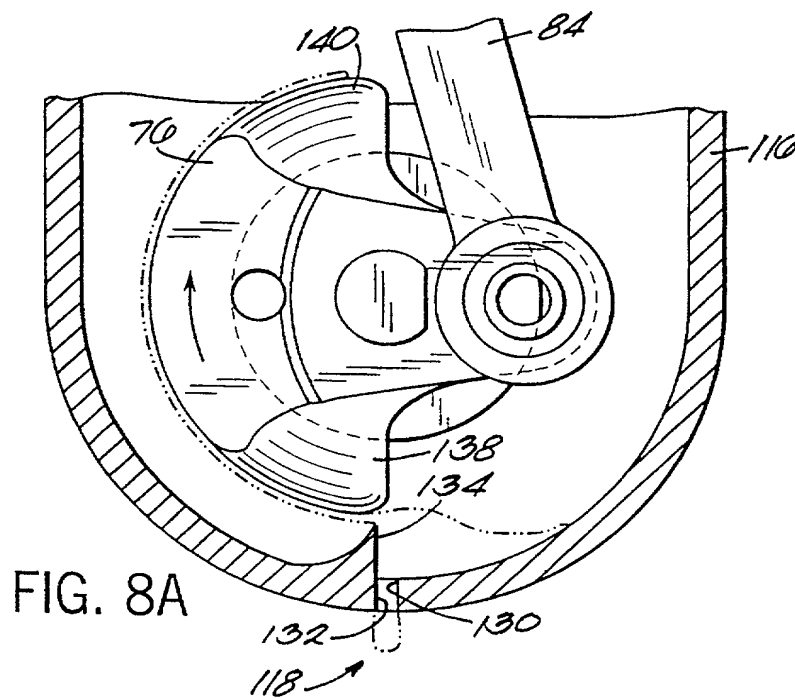
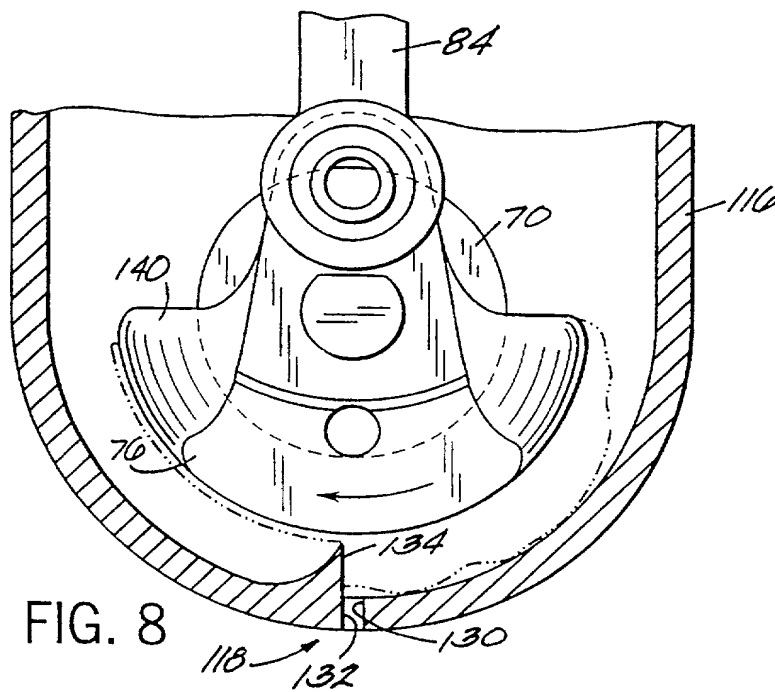
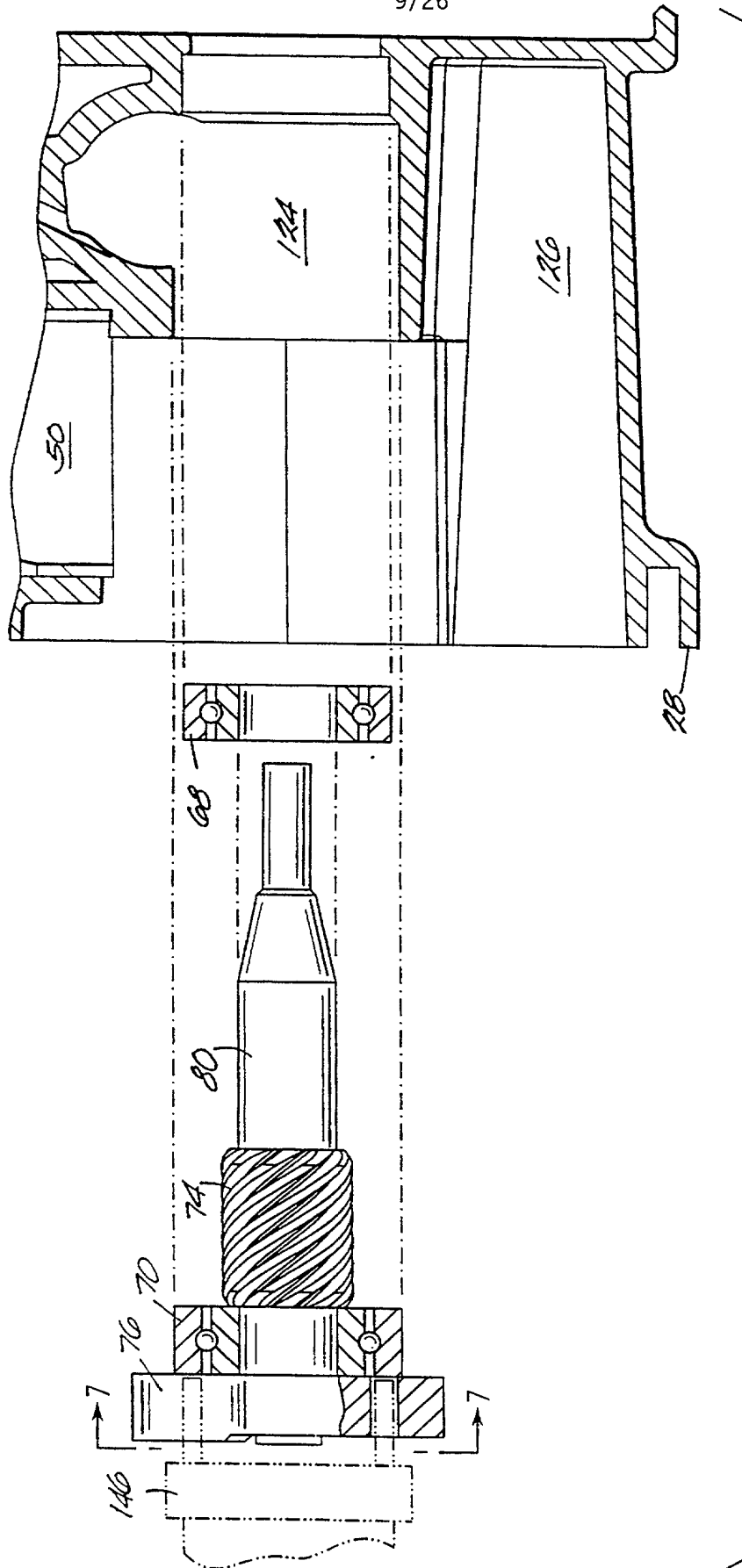


FIG. 6





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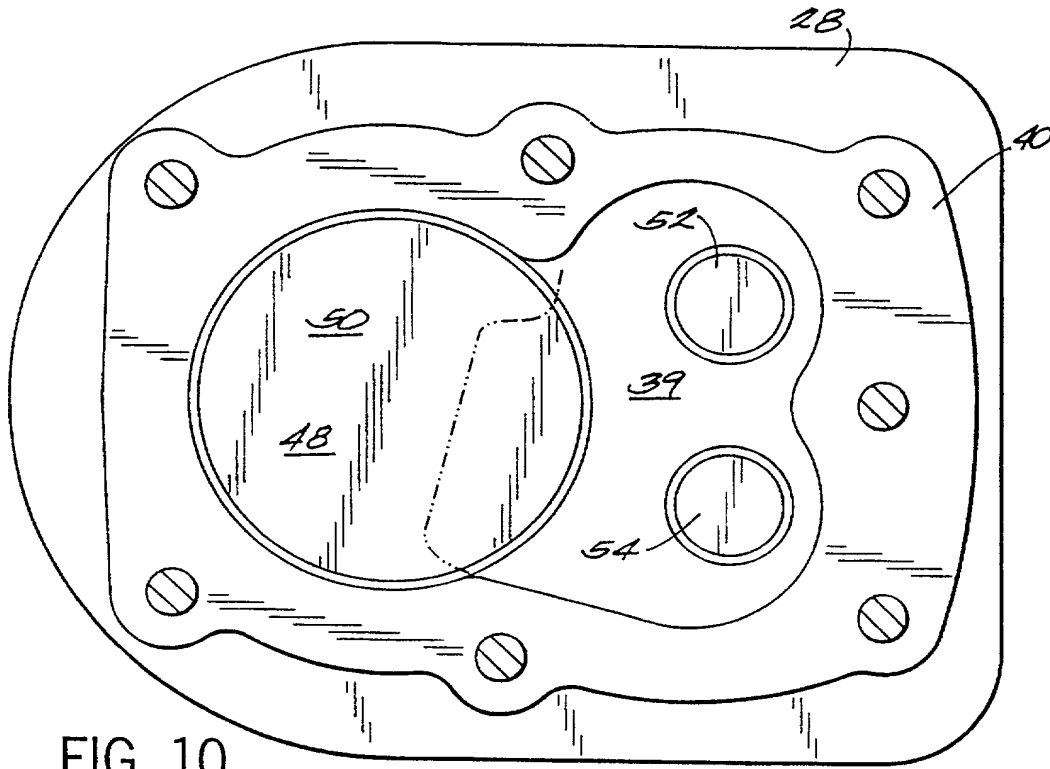


FIG. 10

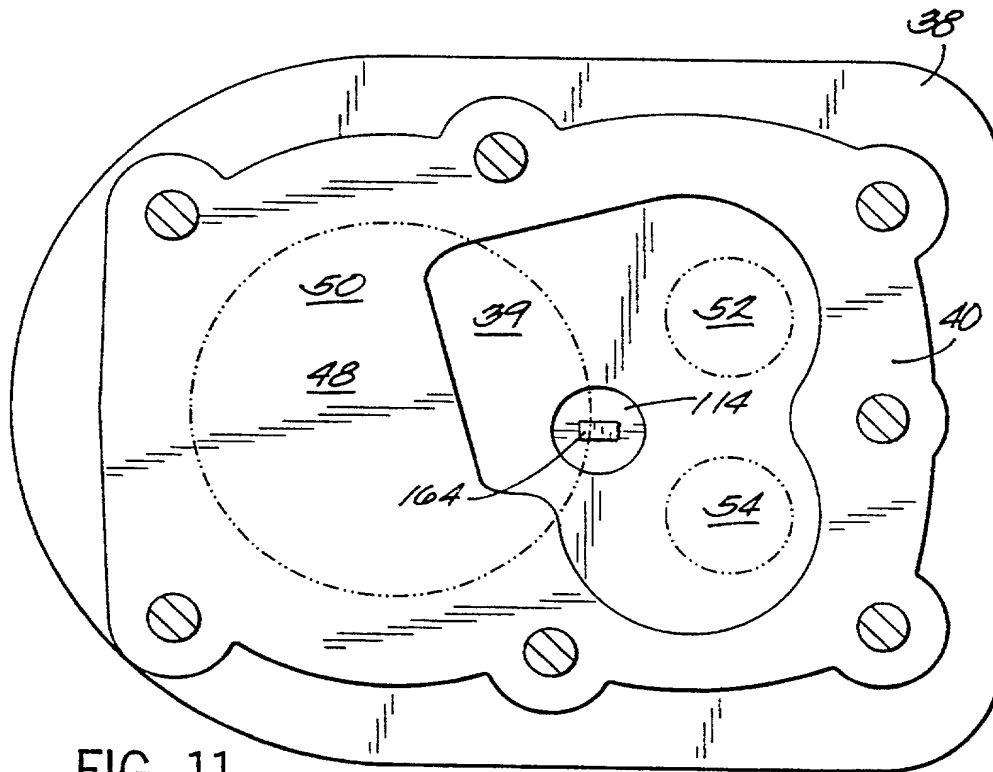
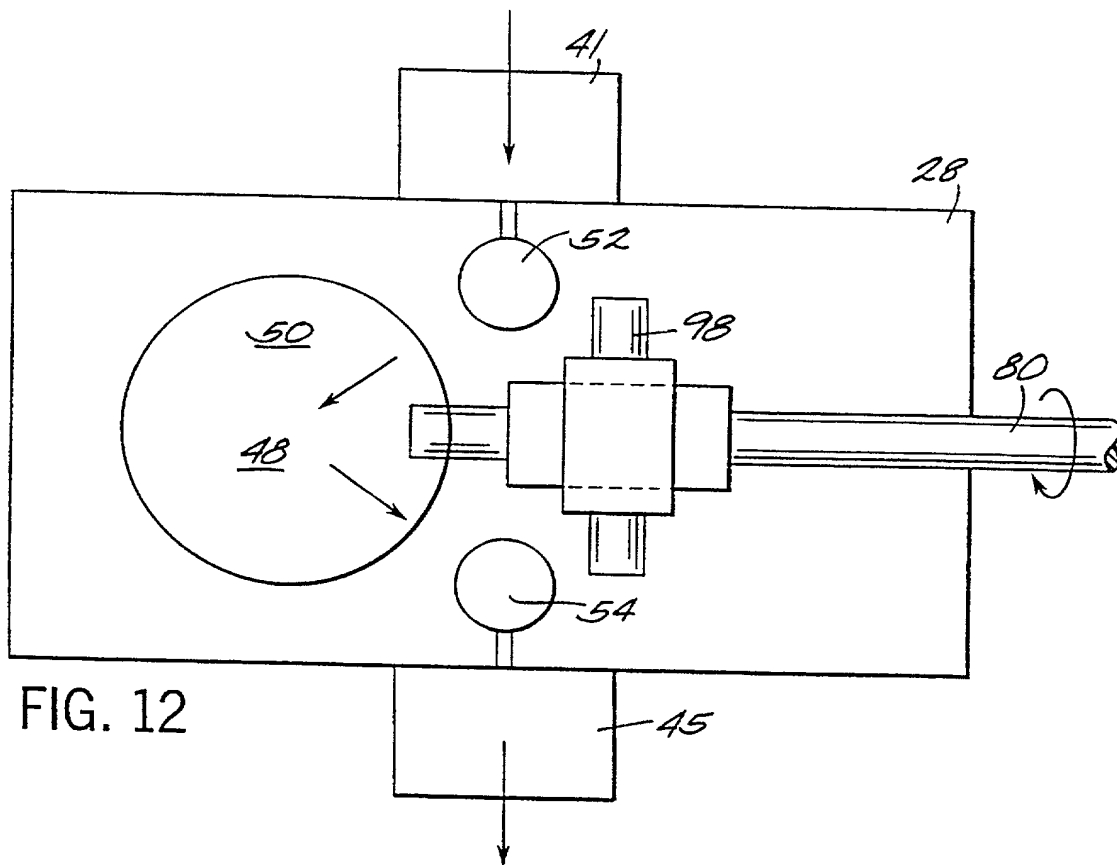


FIG. 11



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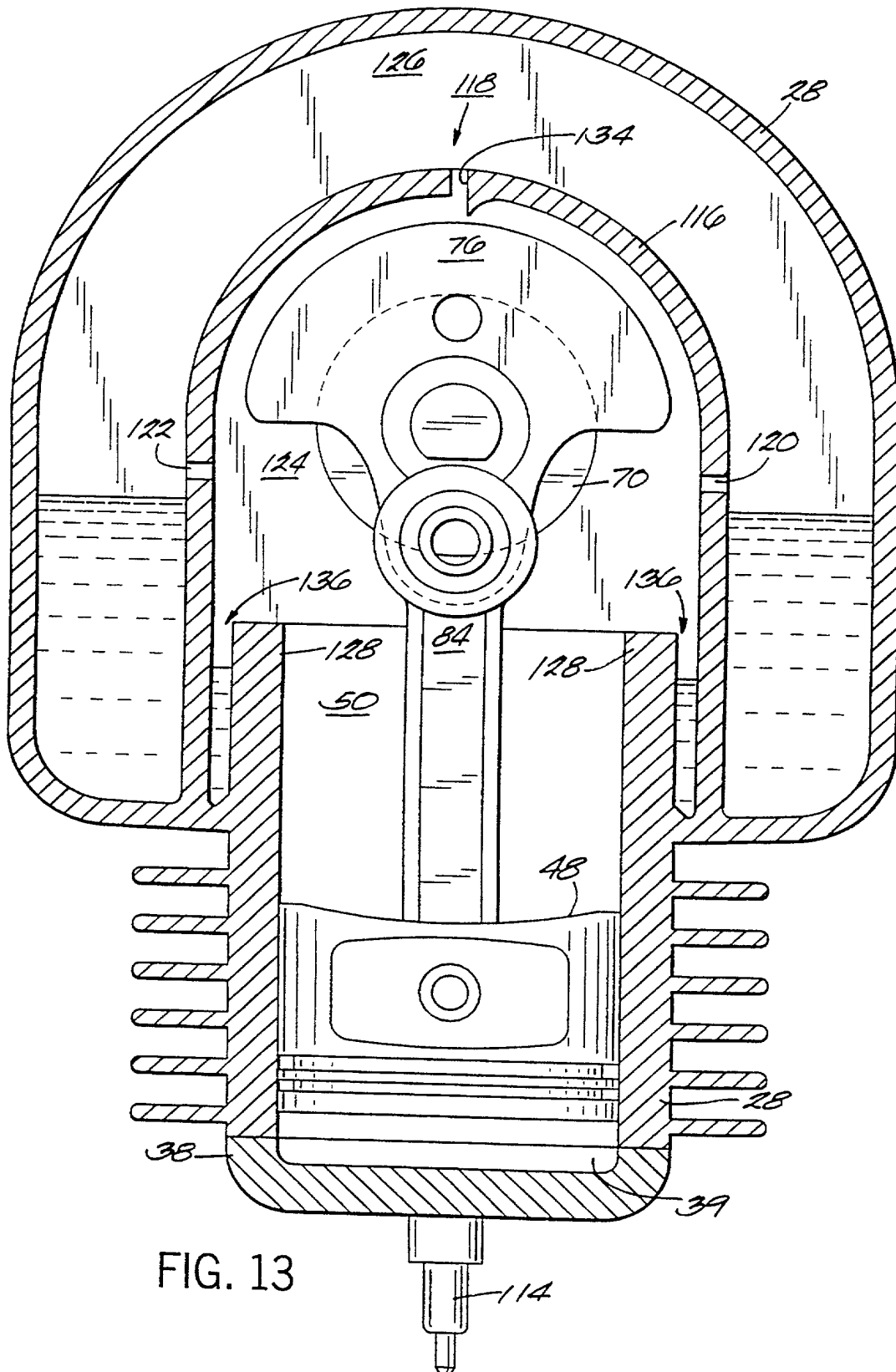


FIG. 13

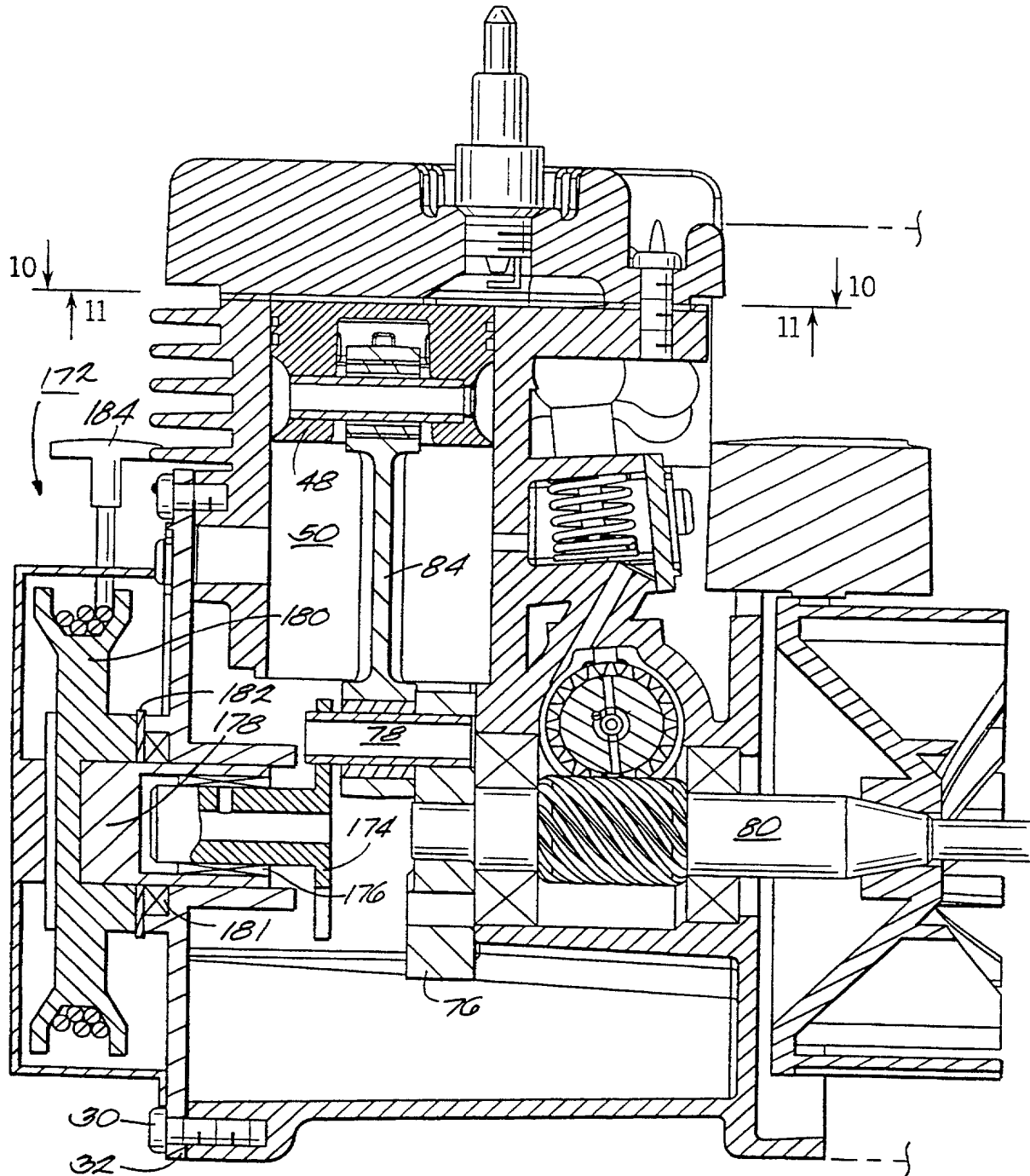


FIG. 14

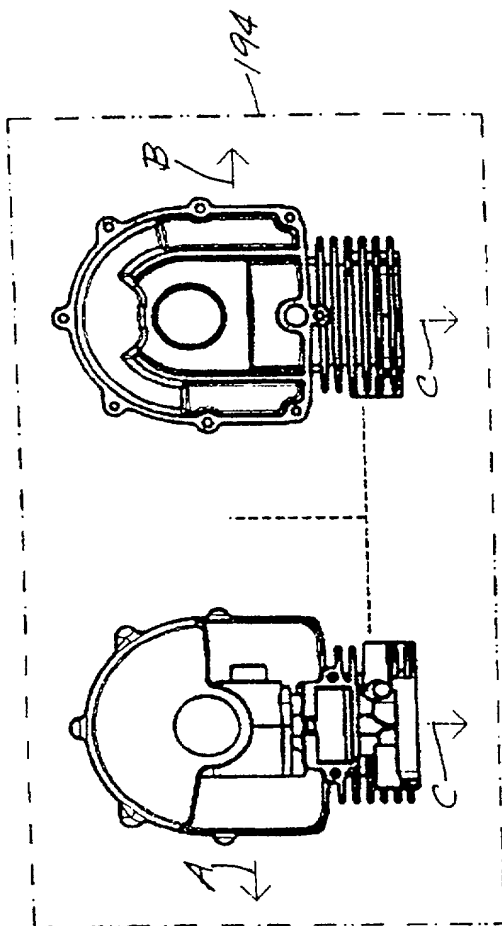


FIG. 15 FIG. 16

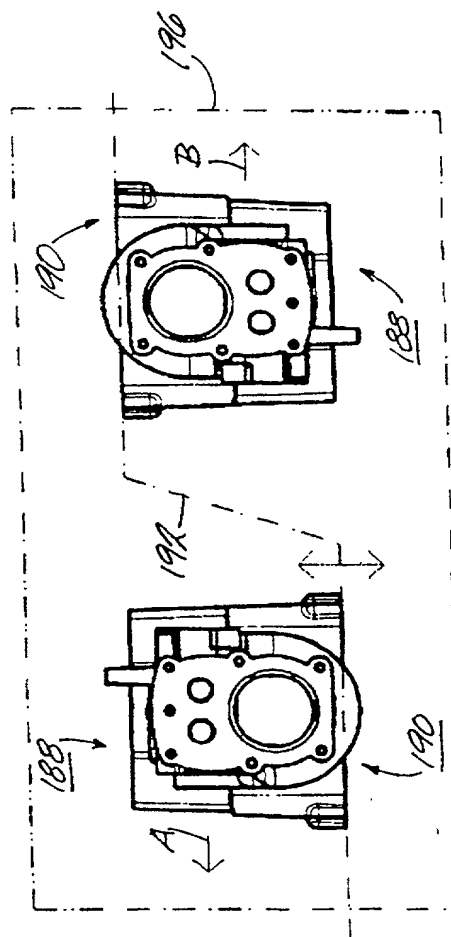


FIG. 17 FIG. 18

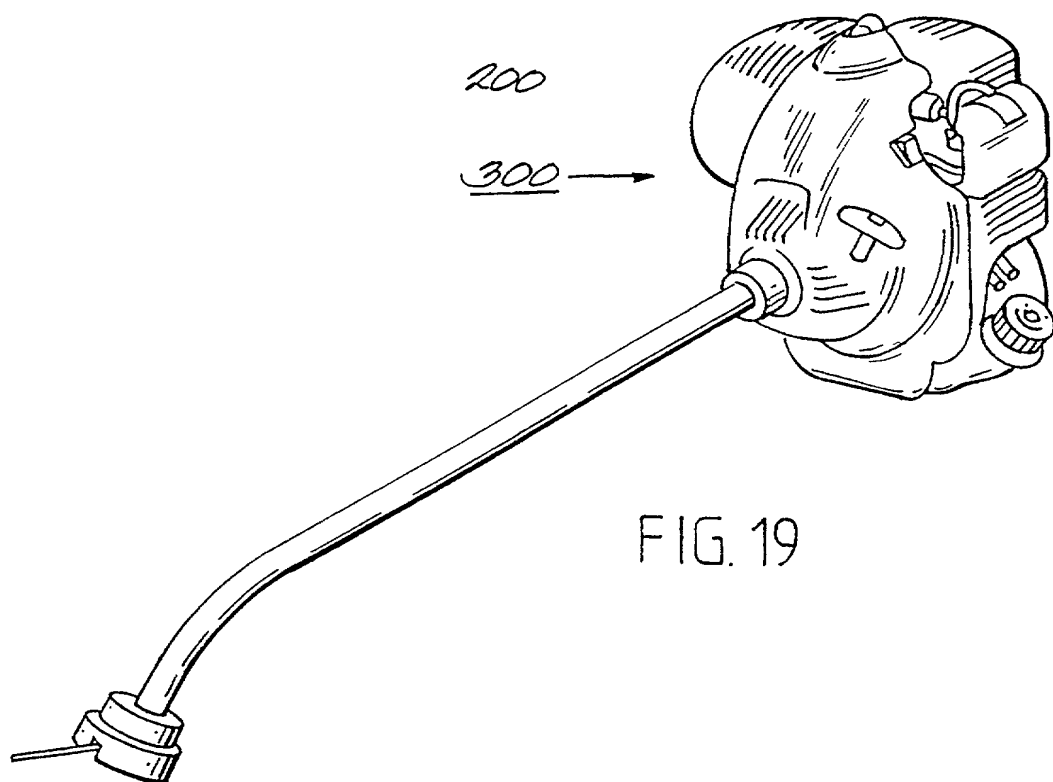


FIG. 19

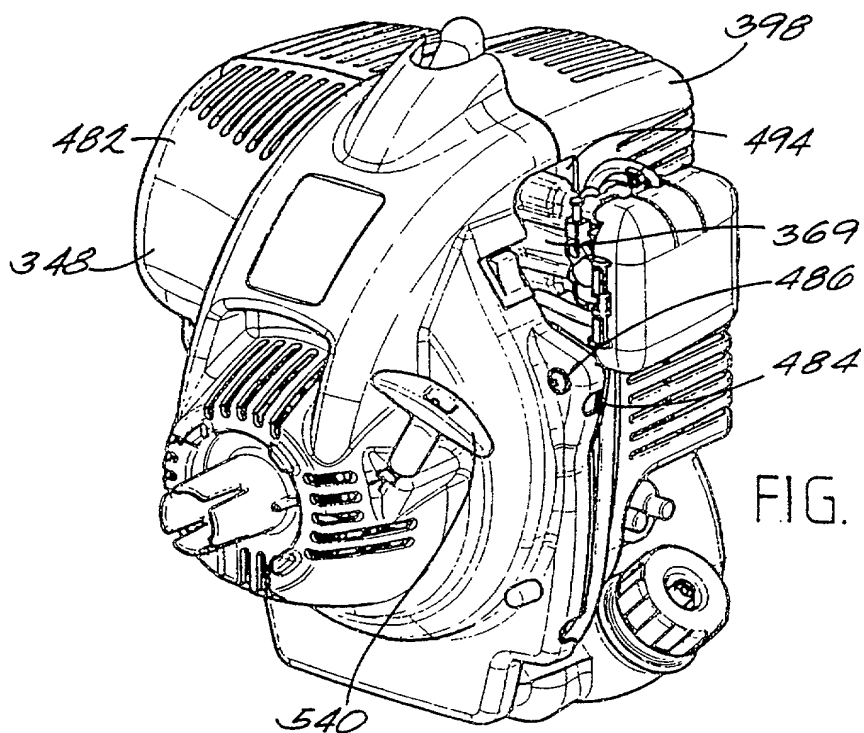
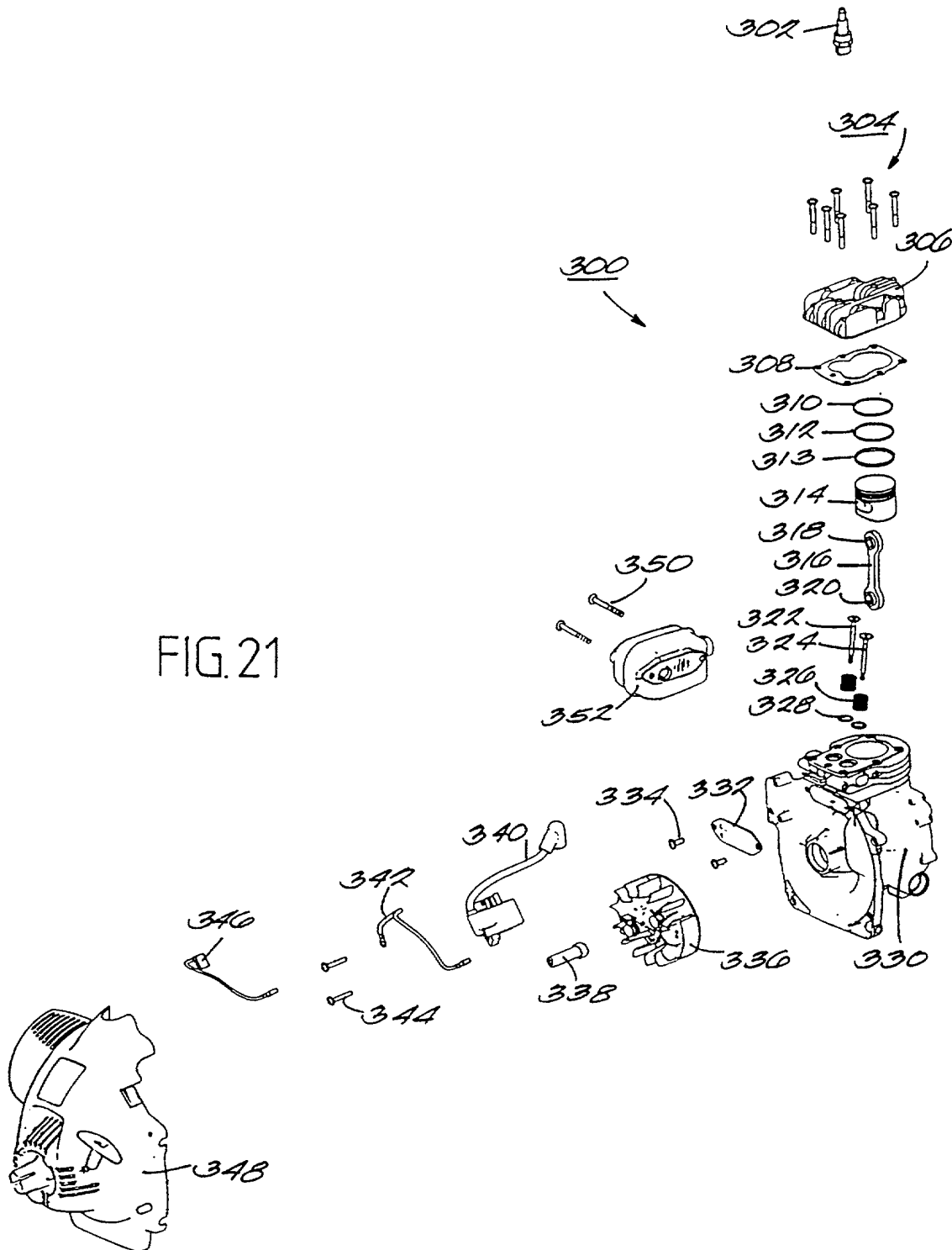
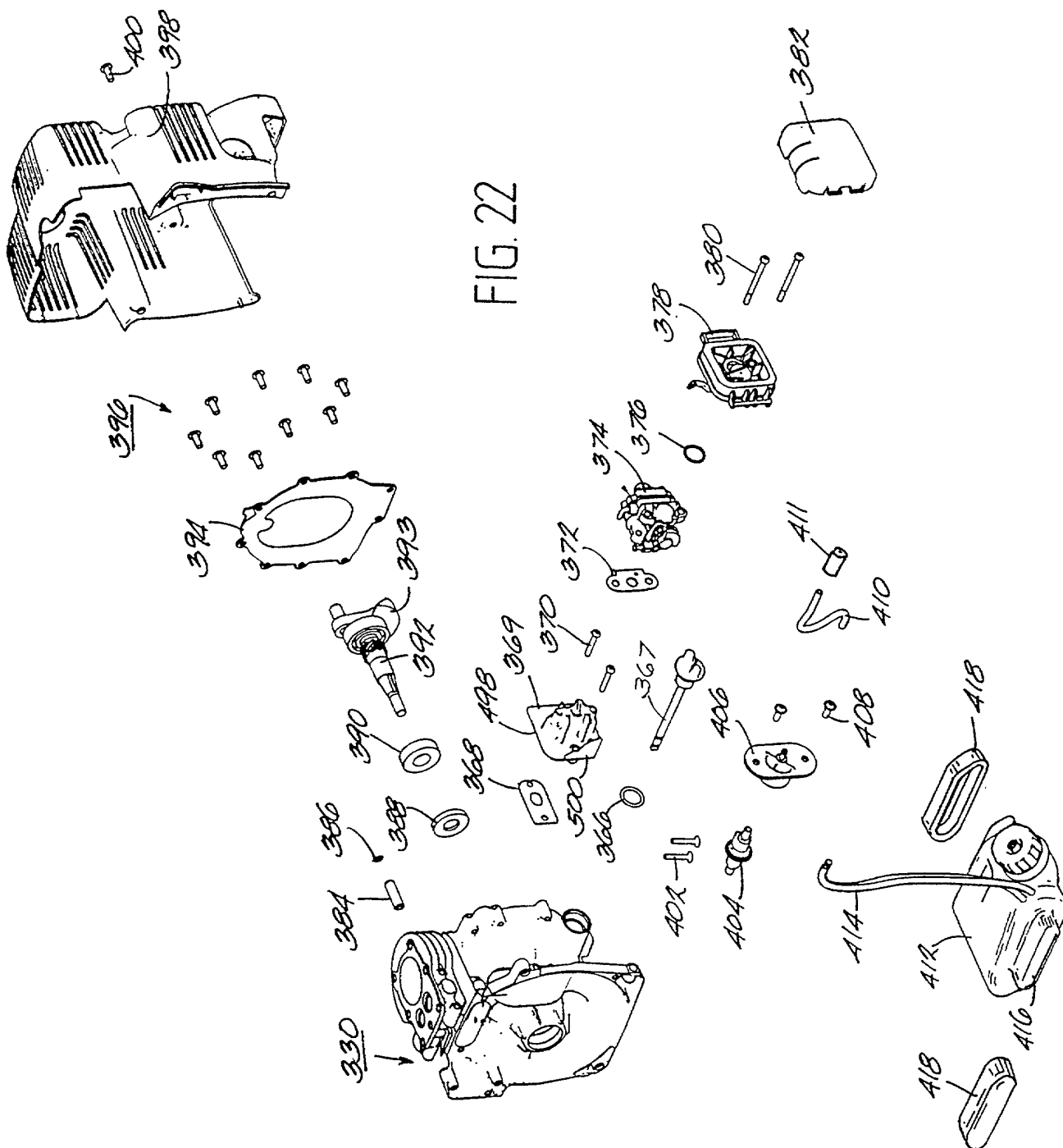


FIG. 20

FIG. 21





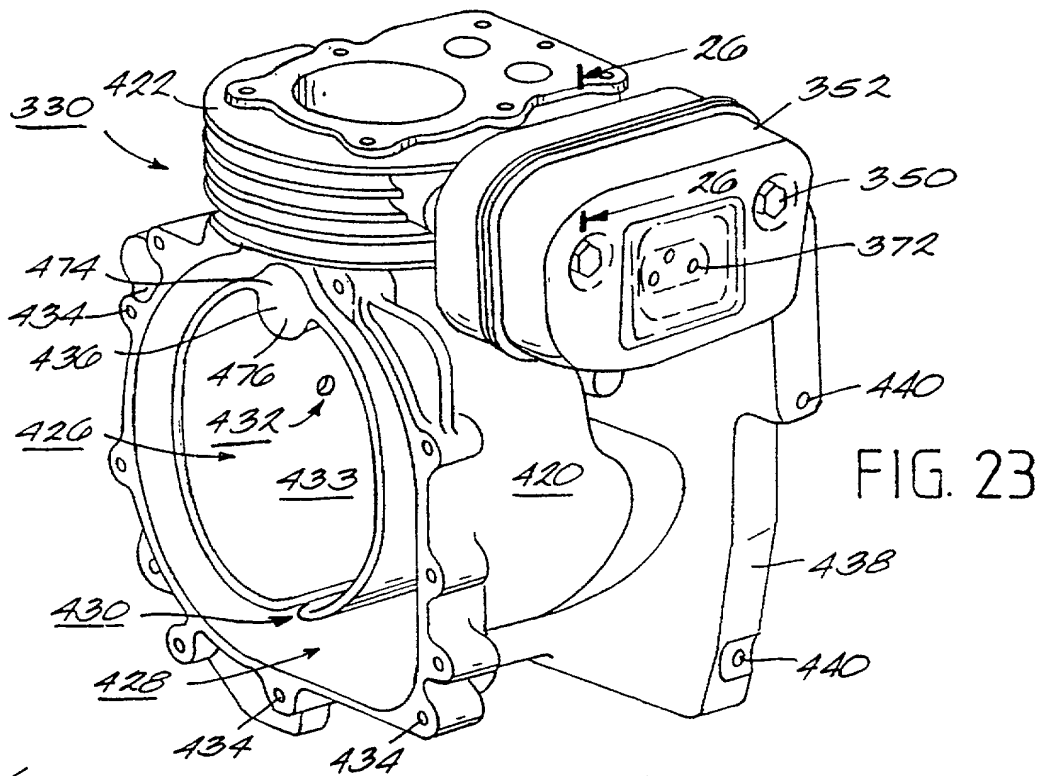


FIG. 23

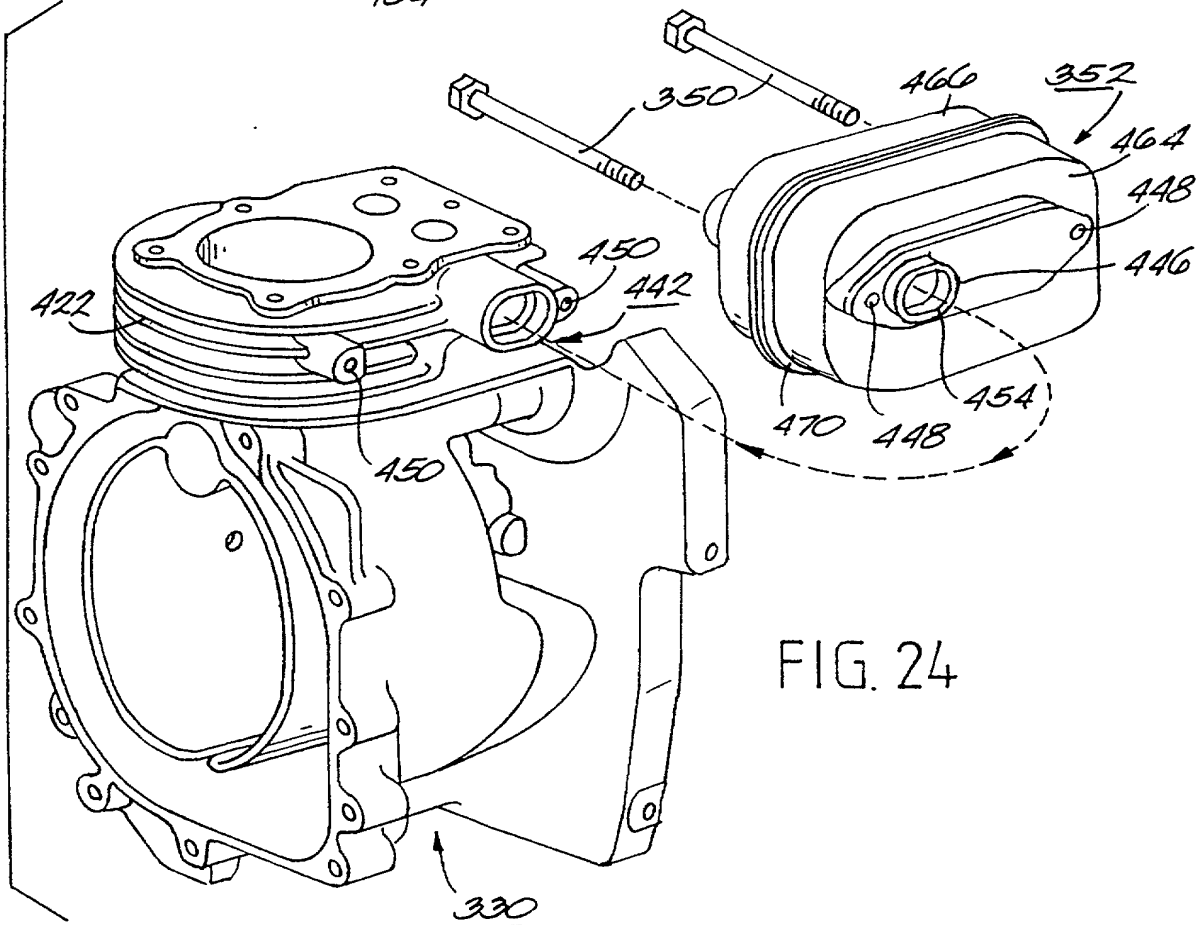
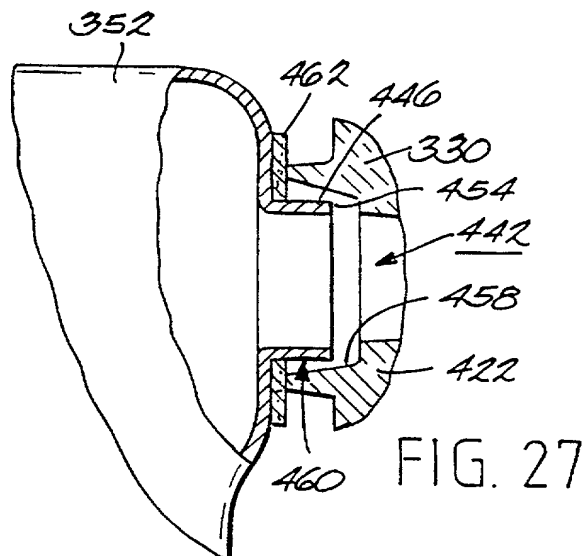
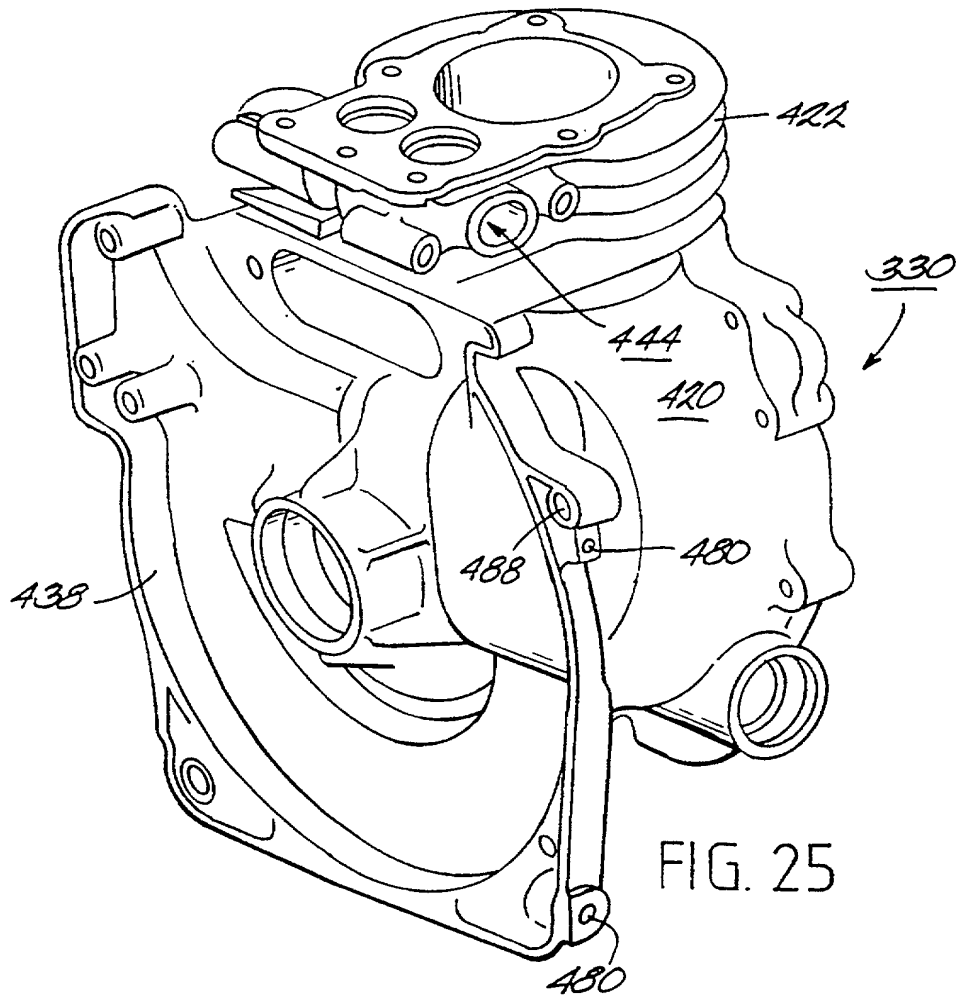
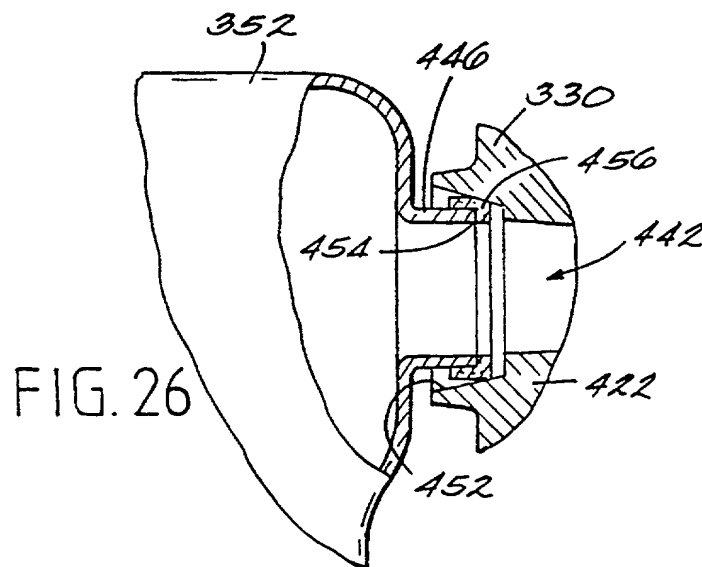


FIG. 24





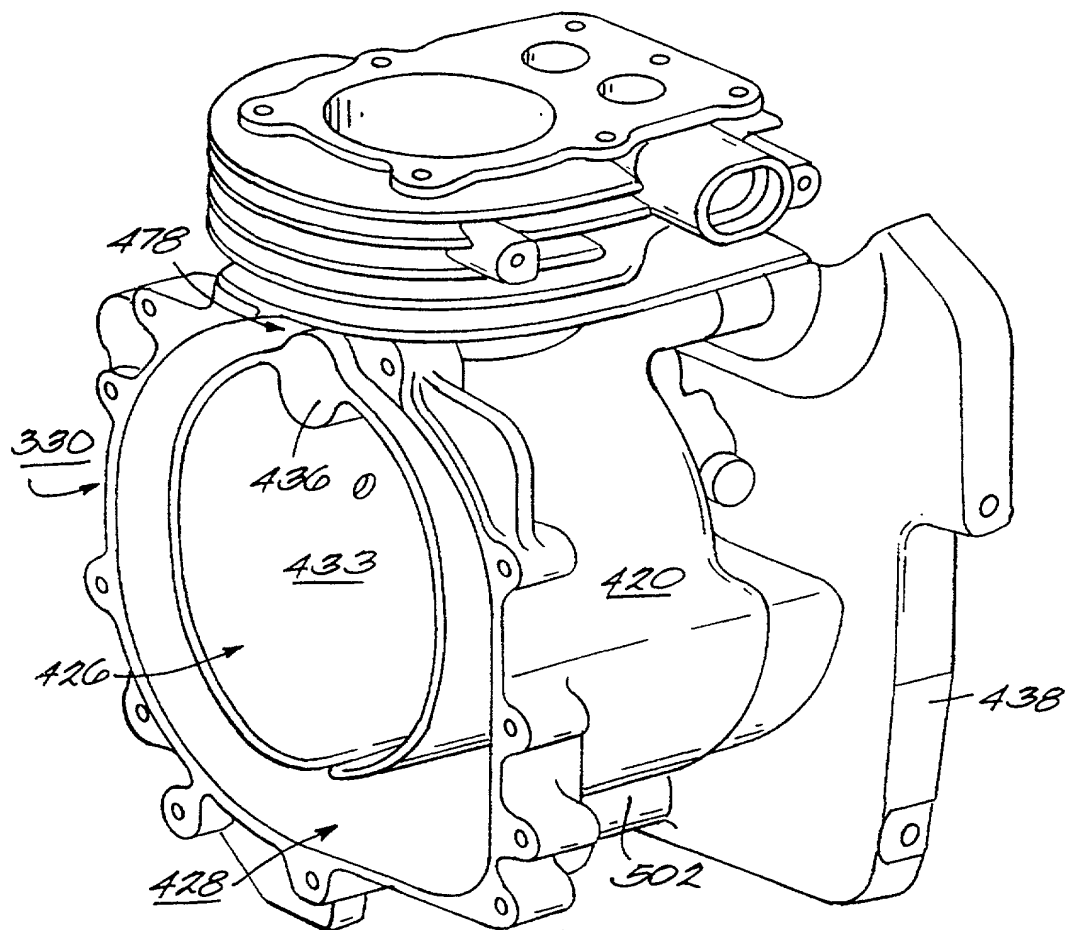


FIG. 28

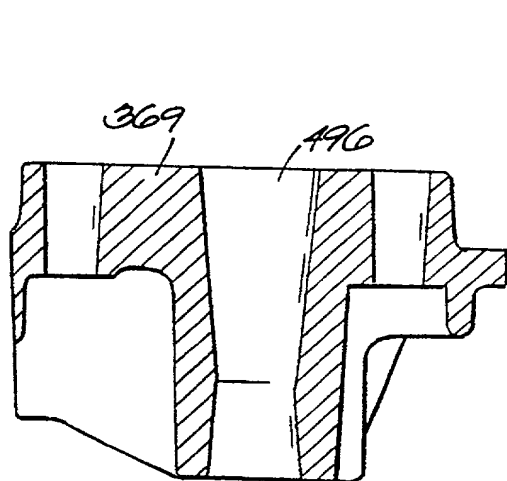


FIG. 30

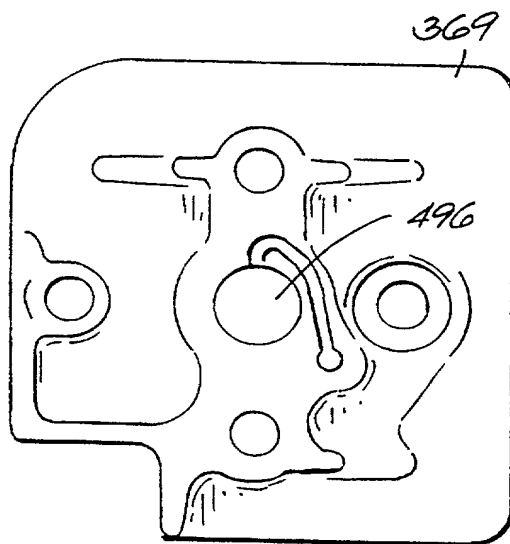
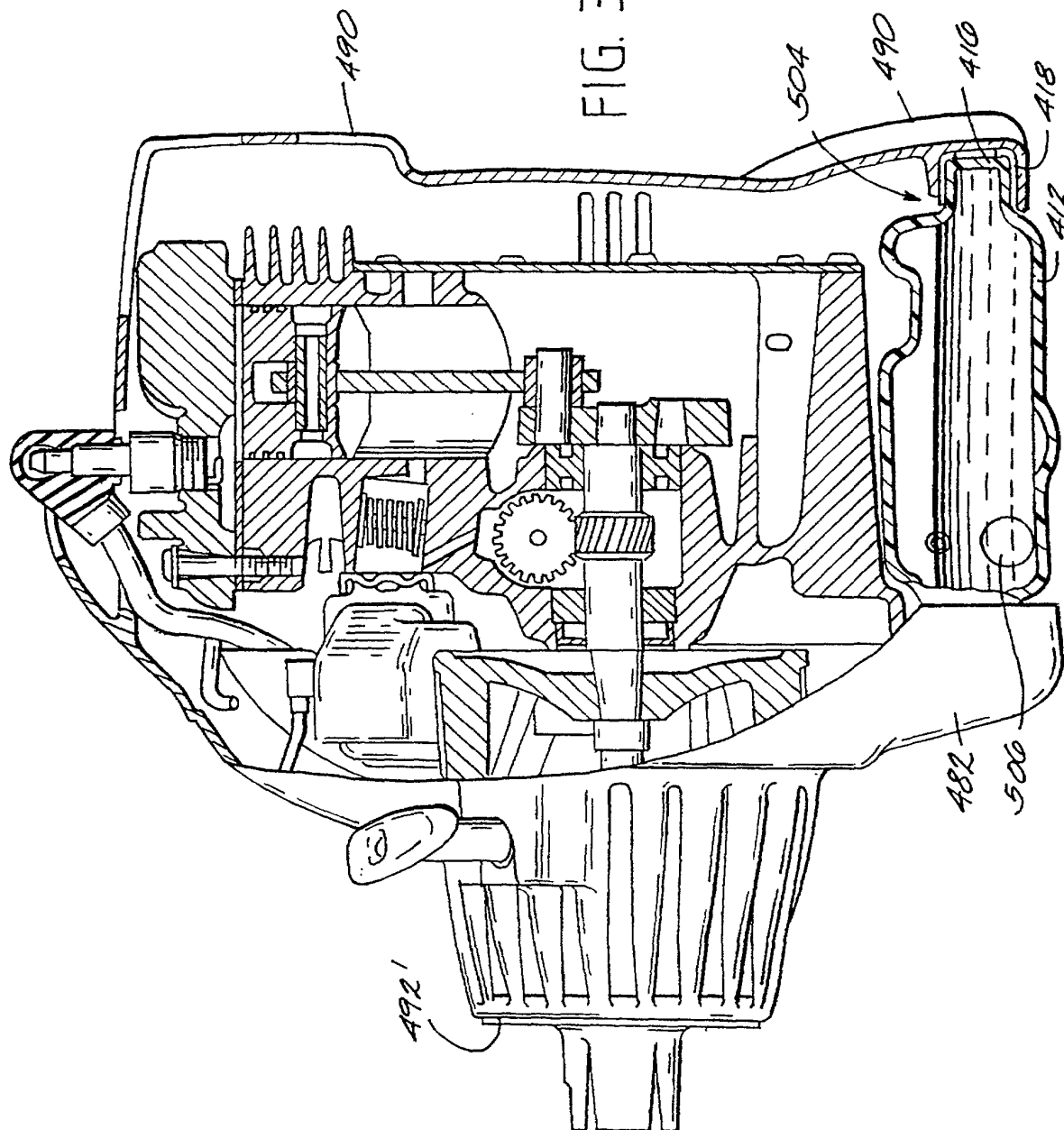


FIG. 29

FIG. 31



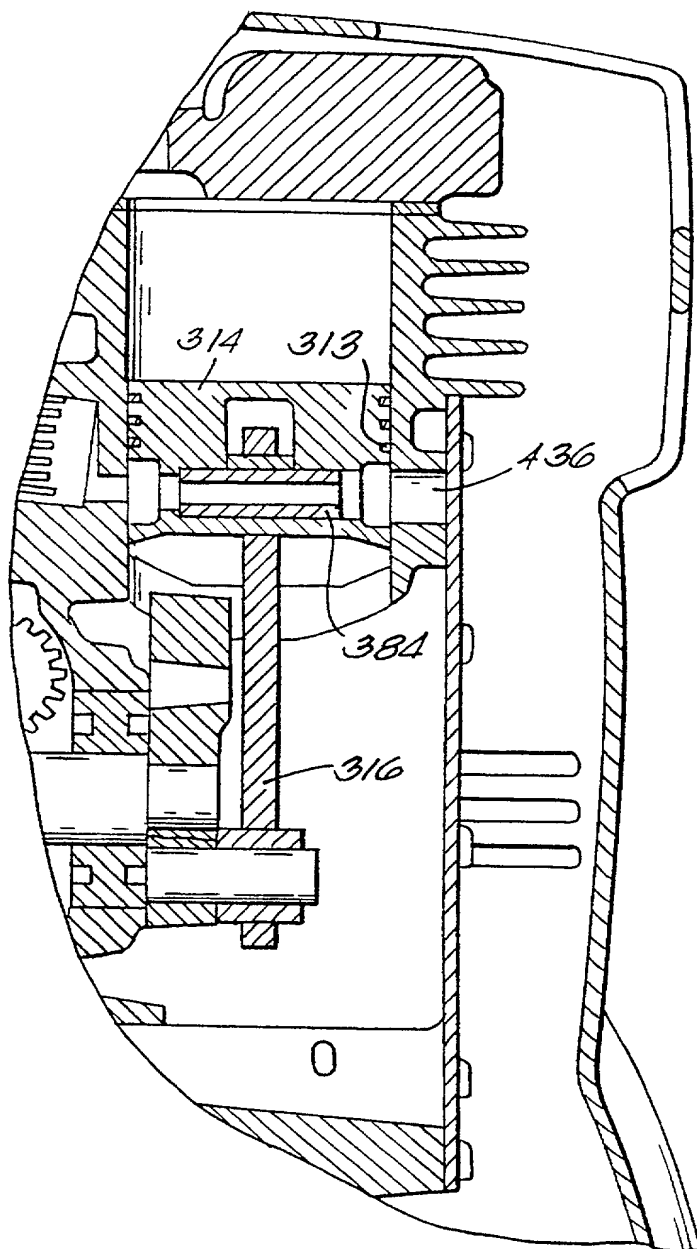


FIG. 32

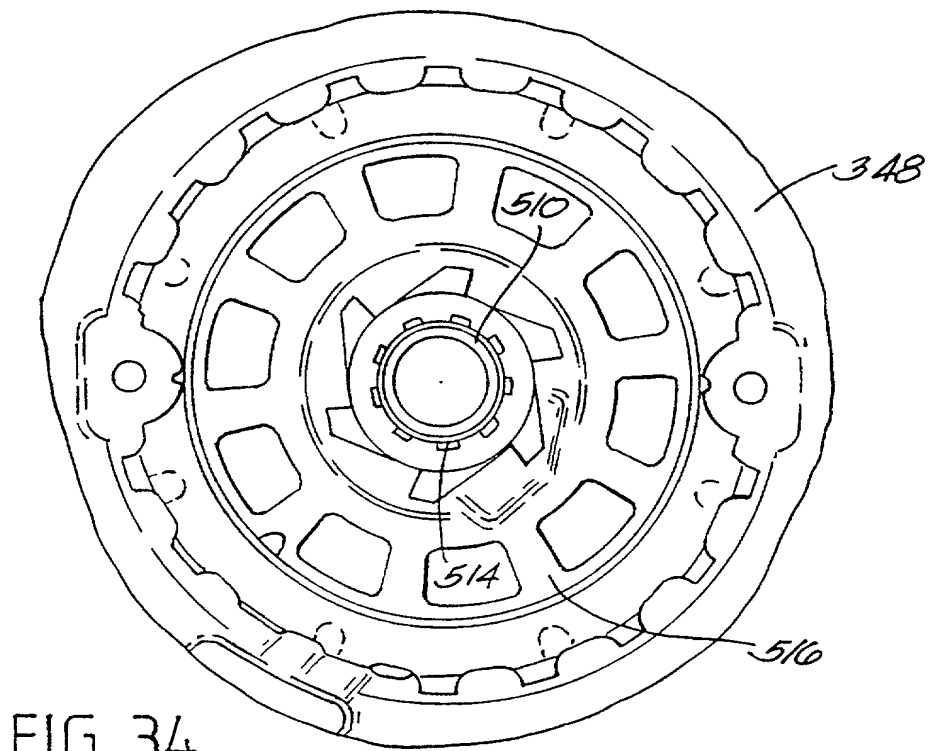


FIG. 34

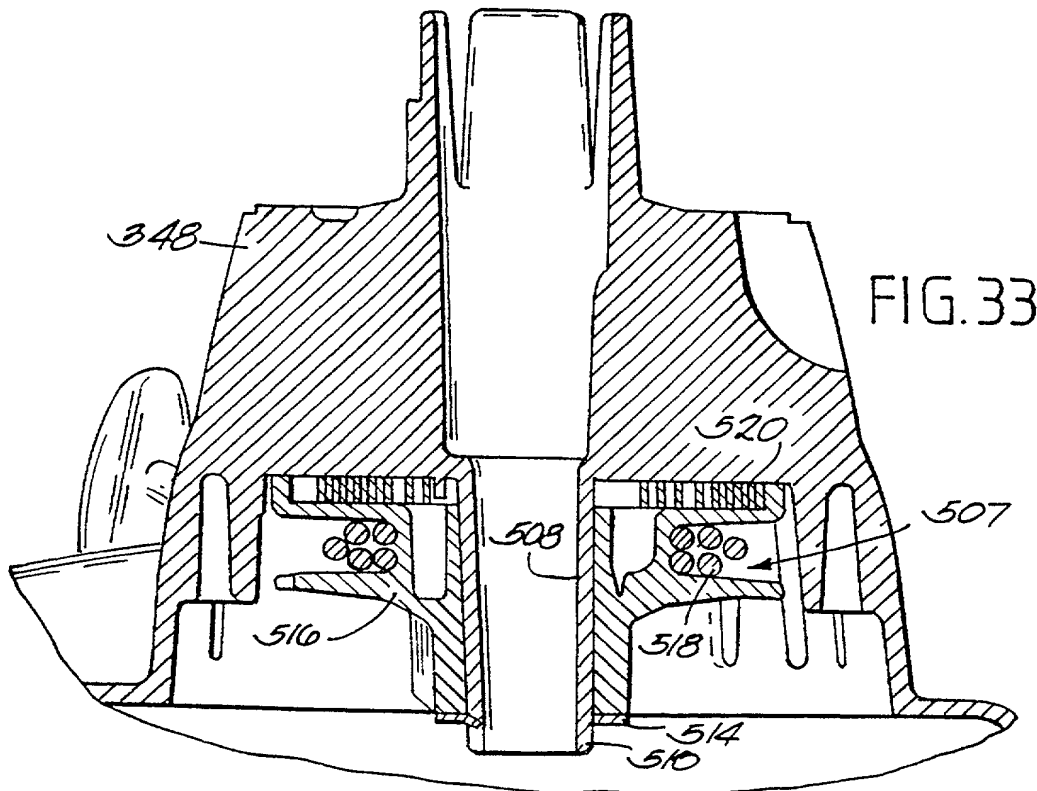
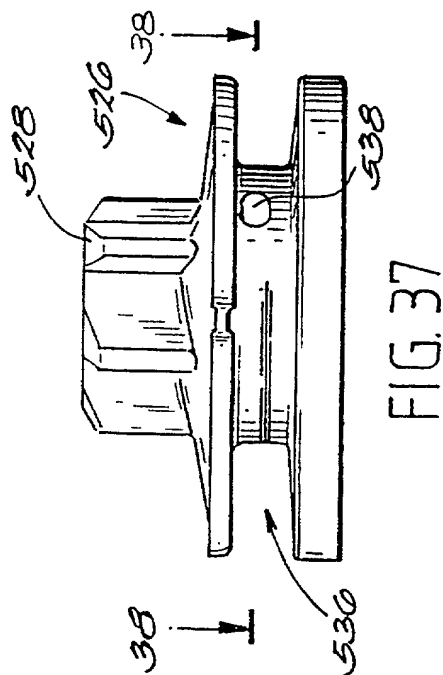
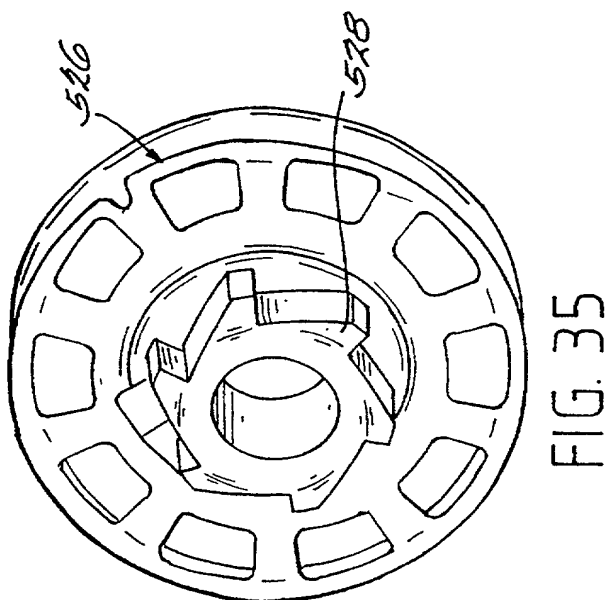
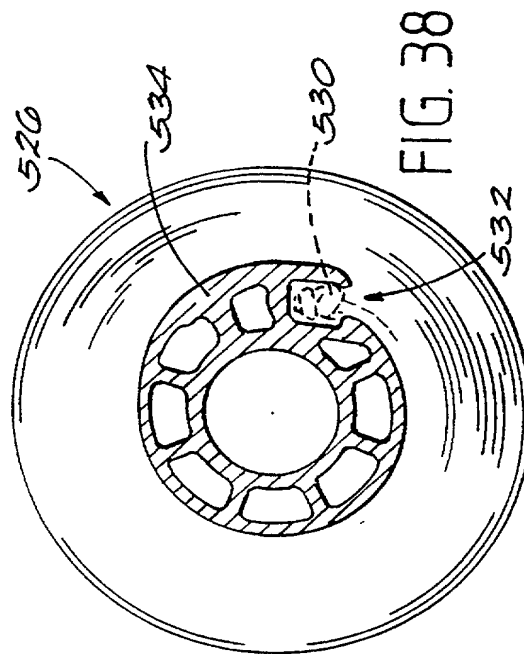
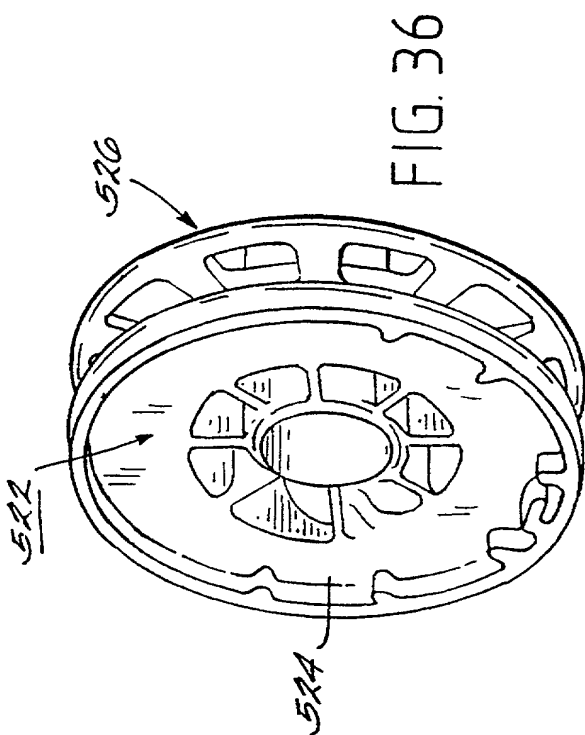


FIG. 33



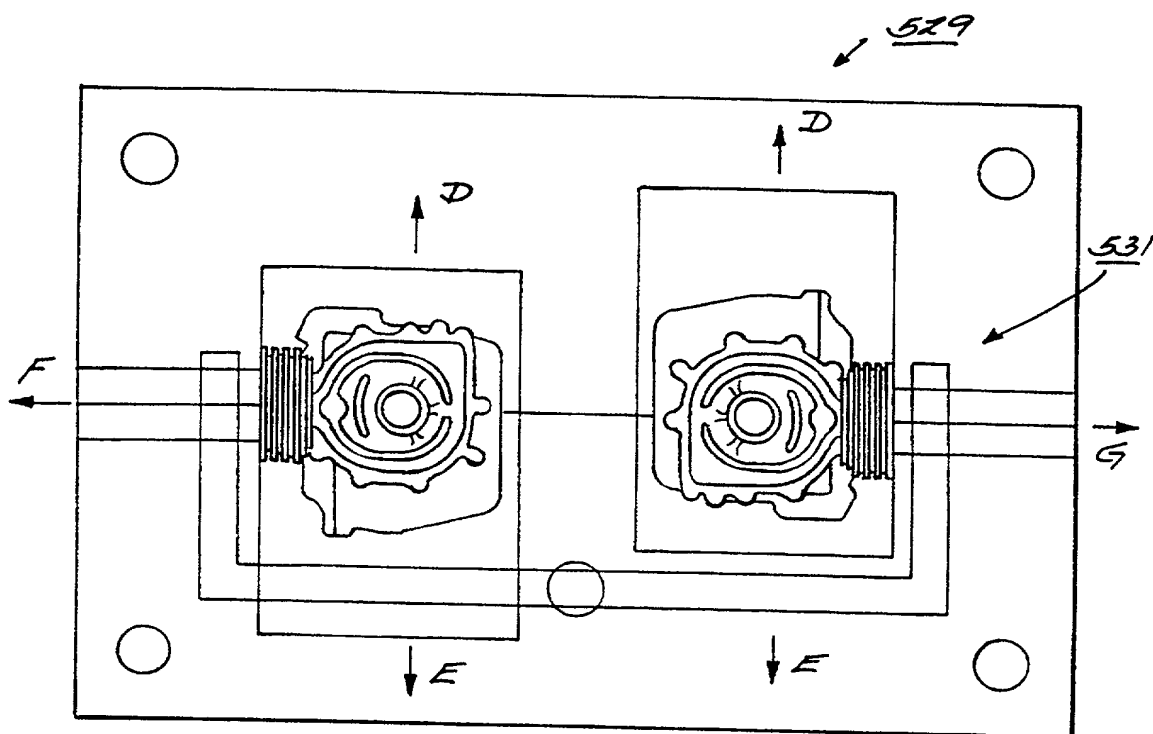


FIG. 39

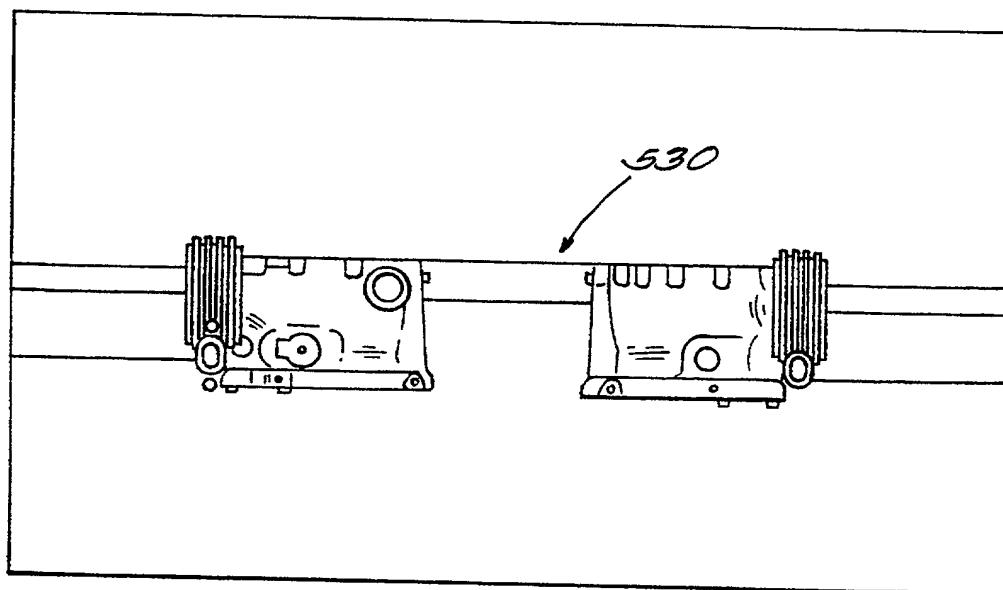


FIG. 40

Declaration and Power of Attorney For Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled FOUR-STROKE INTERNAL COMBUSTION ENGINE (Attorney Docket No. 18367-9547), the specification of which was filed with my authority, on July 11, 2000 as Application Serial No. 09/600,096.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims referred to above.

I acknowledge the duty to disclose to the Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

And I hereby appoint Casimir F. Laska (Reg. No. 30,862), Christopher B. Austin (Reg. No. 41,592), David L. De Bruin (Reg. No. 35,489), Gerald L. Fellows (Reg. No. 36,133), Randall W. Fieldhack (Reg. No. 43,611), Joseph A. Gemignani (Reg. No. 19,482), Gregory J. Hartwig (Reg. No. P-46,761), Daniel S. Jones (Reg. No. 42,697), Richard L. Kaiser (Reg. No. 46,158), Timothy M. Kelley (Reg. No. 34,201), Edward R. Lawson, Jr. (Reg. No. 41,931), Richard H. Marschall (Reg. No. 39,290), Thomas A. Miller (Reg. No. 36,871), Kevin P. Moran (Reg. No. 37,193), Andrew R. Peret (Reg. No. 41,246), David R. Price (Reg. No. 31,557), Thomas S. Reynolds II (Reg. No. 45,262), David B. Smith (Reg. No. 27,595), Derek C. Stettner (Reg. No. 37,945), Billie Jean Strandt (Reg. No. 36,940), Sheldon L. Wolfe (Reg. No. 43,996), Paul F. Donovan (Reg. No. 39,962), Grady J. Frenchick (Reg. No. 29,018), Karen B. King (Reg. No. 41,898), Linda Blair Meier (Reg. No. 39,769), Teresa J. Welch (Reg. No. 33,049), Robert S. Beiser (Reg. No. 28,687), Witold A. Ziarno (Reg. No. 39,888), and each or any of them, my attorneys or agents, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

ADDRESS ALL COMMUNICATIONS IN OR PERTAINING TO THIS APPLICATION
TO:

Casimir F. Laska
Michael Best & Friedrich LLP
100 East Wisconsin Avenue
Milwaukee, Wisconsin 53202-4108

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of the foreign application for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

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(Number)

Prior Foreign Application
PCT
(Country)

13 January 2000
(Day/Month/Year Filed)

I hereby claim priority benefit under Title 35, United States Code, §119 of the provisional U.S. patent application listed below:

Application Serial No.
60/117,215

Filing Date
25 January 1999

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature Peter Hotz

Date: 8 Aug. 16, 00

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Full name of sixth joint inventor: Ronald Lee Bartelt

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